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9.14, Fe_2O_3 2.59, H_2O 2.41, CO_2 .48 = 99.06.—Professor B. K. Emerson has examined microscopically the rock forming a dyke which penetrates the bed of zinc ore at Franklin, N. J., and finds that it is a micaceous diabase, composed principally of labradorite, augite, biotite, and apatite, and containing, as foreign constituents, franklinite, zincite, willemite, and calcite.—The green nickle ore from New Caledonia, exhibited in quantity at the Centennial Exhibition, and known by the name of *Noumeite* or *Garnierite*, is an amorphous hydrous silicate of magnesia, containing more or less admixture of oxide of nickle. It has been considered as allied to Genthite, though probably a mixture. Bertrand considers that its optical character is that of a uniaxial substance.—Professor Shepard withdraws the species *Glaubapatite*, a name which he had given to a supposed soda-bearing guano. The soda was due to the damaged state of the cargo of the vessel in which the guano was shipped.

GEOGRAPHY AND TRAVELS.¹

THE CONGO.—The treaty made by M. Savorgnan de Brazza with the native chiefs at Stanley Pool, is published in the *Proceedings* of the Royal Geographical Society for April. It is dated October 3, 1880, and cedes the territory between the rivers Jué and Inpila to France for the establishment of a station. Mr. Stanley on arriving at Stanley Pool was not allowed to establish a depot or proceed any further in consequence of this agreement, which is considered by the native chief Makoko, as binding him not to receive any Europeans but Frenchmen.

Mr. Stanley on his way up the Congo to the Pool, passed from Isangila to Manyanga entirely by river, but after that, he was obliged to make a road seven miles long, past the Ntombo Mataka Falls where he was again able to take to the river.

The French missionary Père Augouard has also visited Stanley Pool, and on his way discovered a river over eighty feet broad, named the Eluala, which is not marked on Stanley's map.

The natives have also ceded a tract of land on the Congo at Manyanga, to the Belgian expedition for a depot.

Just below the boundary of this tract, the Baptist mission has chosen a site and are building a house. On each side of the river there are many native towns within a short distance of this spot.

LAKE NYASSA.—The headquarters of the missionaries on this lake, has been removed from Livingstonia at Cape Maclear to Bandawé at Misangi Point, S. lat. $11^\circ 56'$ E. long. $34^\circ 6'$, a more healthy and central port. The new road from Nyassa to Tanganyika is to be begun soon. A new steamer is to be sent out by the London Missionary Society to Quillimane and thence to the north end of Nyassa and over the new road when finished, to

¹ Edited by ELLIS H. YARNALL, Philadelphia.

Lake Tanganyika. The water however, continues to fall in the Nyassa, and also in the river Shire, and the navigation of the latter is increasingly difficult. The careful observations on the changes in the water-level made during the past four or five years, will prove of much practical as well as scientific importance.

O'NEILL'S JOURNEY IN MAKUA LAND.—In the *NATURALIST* for April last, we gave a short account of recent journeys in the Makua country lying west from Mozambique. An interesting paper by one of these travelers, Mr. O'Neill, British Consul at Mozambique, was read at a recent meeting of the Royal Geographical Society.¹ As was stated by Lord Aberdare, the President of the Society, "a remarkable fact in connection with the subject, is that the vast territory of Mozambique for the last 200 years had been in the possession of the Portuguese, and yet, so far as could be ascertained, no Portuguese of unmixed blood had ever been more than twenty miles inland."

One of the most interesting features of this journey, is the intelligence thus obtained of the existence of a lofty snow-clad peak in this part of the African continent. It is doubtless the same mountain Mr. Maples heard of when at Meto. Mr. O'Neill writes:—"Whilst at Namùrola, I also ascended a hill 500 or 600 feet high, and had a fair view of the mountain range which rises up west of the valley of the Malema, culminating in the Inagu Hills and Namuli Peak, and forming, if native accounts be correct, the water-shed of the rivers of the Mozambique coast, and those that on its western side help to feed the Lake Kilwa² and its outlet, the Lujende or Liendi. I wish, however, distinctly to say, that although the position of Namuli Peak was pointed out to me, I could not clearly distinguish it. A magnificent range of hills was visible, running apparently north-east and south-west, but the summits of its peaks and many of the hills themselves were totally lost in the mass of cloud and mist which the southerly winds had been drifting up during the past week, and which were, even now, descending as the first of the rains. I have concluded that this peak is snow-clad from the repeated accounts I have received, not only from coast men who have traded in the Malema valley, but also from chiefs and others who live comparatively near the spot. The usual description of it is, "Its top is always white," and 'Mnwishe zake huwezi kuma,' or 'Its summit is invisible.'"

In an address made by Mr. Joseph Thomson after the reading of this paper, he said, "It was a very interesting and suggestive fact, that three Englishmen should have been traveling in the same country at the same time without any knowledge of each other's movements, and yet, not infringing on each other's districts.

¹ Royal Geographical Society *Proceedings*, April, 1882.

² Lake Kilwa is probably identical with the Lake Shirwa of Livingstone and Kirk.
[Ed.]

Thus, Mr. O'Neill kept to the south of the Upper Makua country, the Rev. Chauncy Maples to the middle part, and he (Mr. Thomson) along the northern boundary up the river Rovuma and the Lujende. From the reports of those travelers, together with the accounts given by Bishop Steere and Von der Decken further north, it was very evident that the same natural features extended from the Rufigi to the Zambesi, viz: a slightly undulating and irregular country, at one time spreading out in a great plain, at another forming a narrow valley; while small ridges of hills and isolated picturesque peaks diversified the scenery.

Geologically, the country consisted of metamorphic schists, gneiss, and granite. The schists had been worn away and washed down, forming the plains in the valleys; while the bosses of hard, compact rock had remained as the ridges of hills and isolated peaks. Of course, the most interesting part of Mr. O'Neill's journey, was the neighborhood of the mountain range in Makua, and the strange peak Namuli. That range evidently marked the commencement of the central plateau; and as to the peak Namuli, there could be little doubt that it was snow-clad, because Mr. Maples obtained his information about it from sources quite independent of Mr. O'Neill, and the reports of the two travelers were exactly identical. Considering its position, it must be over 16,000 feet high to be snow-clad. He had no doubt that it would prove to be volcanic; and if so, it would form another link in the chain from the Red Sea to the Cape, which had given rise to the volcanic deposits in Abyssinia at Kilimanjaro, and the enormous series of tufas and lavas which he (Mr. Thomson) discovered round the north end of Nyassa. That line of volcanoes coincided with the line of weakness and dislocation, along which the eastern side of the continent had been upheaved. The areas of depression, Nyassa and Tanganyika, were also approximately parallel to the line of dislocation."

Mr. O'Neill also mentioned an error in the map, by Dr. Petermann¹ in which two lakes appear situated on a tributary of the Lurio, one of which is placed in the heart of Makuani. "I made careful and constant inquiries with respect to these lakes, and was every where assured that no such existed in the Makua country or upon any tributary of the Lurio. The only lake that I can hear of, is that of Kilwa, in the Ajawa country, which, as I have before said, is reported to be the source of the Liendi. It seems not improbable, that there has been some confusion between these lakes. This probability is strengthened by the native statement that the Lake Kilwa is situated in a district called Muongoje, which name I find upon the shore of the easternmost lake in Petermann's map."

ABYSSINIA.—M. Raffray, French Vice-Consul at Massowah, in a recent journey to the camp of the King of Abyssinia, passed

¹ See Map No. 71. Sud Afrika und Madagaskar Stieler's Atlas.

through a portion of that country which is very little known and very different in character from other parts of it—the inner basin of Lake Aussa. The region is thickly wooded, and trees unknown elsewhere are found there. He visited Lake Ashangi (8254 feet) which has no apparent outlet. The level of the lake remains the same throughout the year, and its waters run off through subterranean channels. After traversing the plains inhabited by the Raya Gallas, he ascended the Zebul mountains, an isolated chain, from which the whole Ethiopian mountain system could be seen to the westward, for over seventy miles, while to the eastward immense plains stretched down to the shores of the Red Sea and enclosed the great depression of Lake Aussa—the basin which receives the waters of the Abyssinian plateaux. He afterwards ascended the lofty plateaux of Monts Abboi-Miéda and Abuna-Yusef, the passes of which are respectively 11,400 and 13,200 feet above the sea-level. M. Raffray describes these lofty summits on which grows a plant, reaching a height of twenty-six feet, the *Rhynchopetalum montanum*, and on which are found insects similar to those of temperate Europe. In speaking of the zoölogy of Abyssinia, and especially of the lower classes of animals found there, he defines four distinct regions of different altitudes. The first or coast region belongs to the fauna of the Sahara; the second or valley region, has a fauna similar to that of the Senegal; the region of the lofty plateaux is more peculiarly Abyssinian, with a strikingly similar fauna to that of the Mediterranean; and lastly, the region of mountain tops, varying in altitude from 11,483 feet to 13,124, belongs to the fauna of the mountainous parts of temperate Europe.

SCHUVER.—Mr. Schuver is continuing his explorations in the region south-west of Abyssinia. He finds that there are two Jaboos rivers—the word meaning simply a running stream. The Jaboos of the Blue Nile has its most southern and principal source at the foot of the lofty Mount Wallel, in lat. 8° 50' N. The most easterly and chief sources of the River Yal (affluent of the White Nile) is in the western valleys of the Shugru Mountains, the eastern base of which is bathed by the Blue Nile Jaboos. As far as the Yal flows through the territory of the Aman negroes, it bears the name of Valasat, but after it has passed the Banghe defile in a series of cataracts falling 2000 feet in twelve miles, and reaches the Berta country, it takes the name of Jaboos, the name by which the other permanent river of that country is known. In ascertaining these interesting facts, Mr. Schuver followed the western Jaboos down to the junction of the Owé, the principal river of the valleys south of Gomashe; thenceforward it passes into the Burus plains, where it takes its final name of the Yal.

THE NEW POLAR STATIONS.—The Danish station has been changed from Upernavik, as first proposed, to a more southerly position at Godshaab, on the west coast of Greenland, so as to be at a greater distance from the American station at Lady Franklin Bay and the Austrian at Jan Mayen. The expedition, which is well fitted out at government expense, will sail from Copenhagen about May 20th, and is expected to reach Godshaab at the end of June. It is to remain there until September, 1883.

The Dutch propose to establish their station at Dicksonshavn, at the mouth of the river Yenisei, unless the ice prevents their reaching it, in which case they will go to the north-east point of Novaya Zemlya. Funds have been supplied for this purpose partly by the government and partly by public subscriptions. The party will be about twelve in number and will take with them all the instruments and apparatus specified by the International Polar Conference besides other instruments and a wooden house. It is hoped that an ascent of the Yenisei can be made in a steam launch.

The British Government has granted the sum of £2500 and the Canadian Government \$4000 for a circumpolar station.

The Italian Antarctic Expedition started from Buenos Ayres on November 8, 1881, under command of Lieutenant Bove. The government of the Argentine Republic has sent out a commission with the expedition for the purpose of carefully revising the survey of the coast of their country; thus the expedition now consists of four ships, viz: *Santa Cruz*, *Uruguay*, *Cape Horn* and a steam bark. The *Cape Horn* is the largest vessel and will proceed to the Antarctic regions, while the *Uruguay* will remain at Cape Horn. Lieutenant Bove hoped to leave Cape Horn by the end of December, in order to sail across to South Shetland and Grahamsland. He hoped to be back at Tierra del Fuego by the end of March, to stay there until May, and then to leave for Buenos Ayres.

MICROSCOPY.¹

MEASUREMENT OF MICROSCOPIC APERTURE.—Hon. J. D. Cox, in a very interesting article in the *Am. Month. Mic. Journ.*, discusses the present method of measuring angular aperture of the microscope by taking the angle of which the apex is the center of the microscopic field of view, and whose sides bound the telescopic field of view when the microscope is turned into a telescope, either by removing the ocular and looking down the tube with the naked eye, or by substituting a terrestrial eye-piece by restoring the ocular and adding an objective as an erector in the draw-tube. By experiments, confirmed and explained by geometric principles, he concludes that the telescopic aperture, however correctly measured, is not the microscopic aperture; and that the difference, which is practically immaterial in objec-

¹ This department is edited by Dr. R. H. WARD, Troy, N. Y.